FOOD BREADING APPARATUS

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a divisional of application Ser. No. 08/895,472, filed Jul. 16, 1997, currently pending, which is a continuation of application Ser. No. 08/752,209, filed Nov. 19, 1996, U.S. Pat. No. 5,664,489.

TECHNICAL FIELD OF THE INVENTION

This invention relates generally to food processing devices and, more particularly, to an apparatus for breading food products.

BACKGROUND OF THE INVENTION

Pre-prepared food products are much in demand by today's consumers. Food products that are pre-cooked and only require final heating before consumption are desired by both household consumers and commercial food establishments. Fried and oven baked foods especially those having a breaded coating are especially popular in the category of pre-prepared products.

Breaded food products were traditionally prepared individually by hand rolling the food product, for example a chicken breast, in a breading preparation. The breading preparation may be wheat flour or corn meal and spices. After the breading is applied, the food product is typically fried or baked.

Anyone who has breaded food products by hand can understand the time consuming and messy nature of the breading process. Prior attempts at mechanical breading apparatus have been largely unsuccessful. Prior art mechanical systems have incorporated drive systems and hydraulics in and around food containing components, thereby subjecting the food products to potential contamination. Additionally, prior art mechanical breading devices have been largely unsuccessful at removing lumps from the breading mixture. As the lumps are recirculated they continue to grow in size and ultimately pass with the breaded product to further food processing stations. If additional resources are not expended in subsequent sorting operations, the lumps of breading will be packaged with the final breaded product and delivered to the customer. Therefore, there exists a need for a quick, efficient and sanitary food breading apparatus capable of removing the lumps of breading mixture.

In accordance with the present invention, a food breading apparatus for breading food components with a breading mixture includes a breading drum rotatable about its longitudinal axis. A drum cradle supports the breading drum. The drum cradle is pivotally mounted to allow for adjustment of the inclination angle of the longitudinal axis of the breading drum from horizontal.

The drum includes an inlet opening located in an upper end, an outlet opening located in a lower end, and a plurality of openings located proximal to the lower end of a sidewall. The openings are sized to allow surplus breading mixture and lumps of breading mixture to pass therethrough but retain the breaded food product in the rotating breading drum.

An inlet conveyor directs food components to be breaded into the inlet opening of the breading drum. A recirculating breading mixture conveyor provides the breading mixture to the inlet opening. A takeout conveyor directs breaded food components away from the outlet opening of the breading drum. A lump removal conveyor is positioned below the openings in the sidewall of the breading drum. The lump removal conveyor includes a plurality of openings sized to allow passage of surplus breading mixture therethrough but retain the lumps of breading mixture for transport to a catch pan for disposition.

A surge hopper and conveyor positioned below the lump removal conveyor collects surplus breading mixture passing through the openings in the lump removal conveyor and transports surplus breading mixture to the recirculation conveyor. A metering hopper is mounted on the surge hopper and stores and dispenses non-recycled breading mixture into the surge hopper at a predetermined rate sufficient to equate to the rate breading mixture is leaving the breading apparatus on the breaded products and as removed lumps. The mixed non-recirculated and recirculated breading mixture passes into the recirculation conveyor wherein the cycle heretofore described begins again.

The present invention is superior to the prior art systems in that the drive motors and hydraulic systems are remotely located away from the food products, thereby avoiding potential contamination of the food products. Additionally, the breading drum, the lump removal conveyor, the input conveyor, the output conveyor, the recirculation conveyor and surge hopper are all independently driven. Such independent drivers provide versatility for operation of the various breading apparatus components.

Prior art food breading apparatus do not include a lump removal conveyor for removing lumps in the breading mixture prior to recirculation of the breading mixture. If the lumps are not removed they grow in size during successive recirculation and ultimately pass with the breaded product to further processing stations generating additional waste.

Prior art food breading apparatus also do not include a metering hopper. The metering hopper contributes to the improved quality and consistency of the breaded product by greatly reducing wide swings in moisture content of the breading mixture, thereby allowing consistent adhesion of the breading to the product and providing an even breading coverage and thickness.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing objects, advantages, and features, as well as other objects and advantages, will become more apparent with reference to the description and drawings below, in which like numerals represent like elements and in which:

FIG. **1** is a side view of the food breading apparatus of the present invention;

FIG. **2** is a top view of the food breading apparatus of FIG. **1**;

FIG. **3** is an end section view of the food breading apparatus of FIG. **1** taken at section **3**—**3**;

FIG. **4** is an end view of the food breading apparatus of FIG. **1**;

FIG. **5** is a partial side view illustrating a breading mixture, metering hopper and a breading mixture surge hopper of the present invention;

FIG. **6** is a partial top section view of the breading mixture metering hopper and the breading mixture surge hopper taken at section **6**—**6** of FIG. **5**;

FIG. **7** is a partial top view of a breading drum of the present invention;

FIG. **8** is a partial end section view of the food breading drum of the present invention taken at section **8**—**8** of FIG. **7**;